

CLAIMS

What is claimed is:

1. A structure for mounting electronic devices comprising:
an explosion-proof housing, at least one electronic device mounted within the explosion-proof housing;
a mast mechanically connected to the explosion proof housing;
a solar panel array mechanically connected to the mast;
a radio antenna; and
a plurality of wires coupled to the solar panel array and radio antenna, the wires pass through a bore axially through the mast to enter the explosion-proof housing.
2. The structure for mounting electronic devices as defined in claim 1 wherein the radio antenna mechanically connects to the mast.
3. The structure for mounting electronic devices as defined in claim 2 wherein the mast mechanically connects to an upper surface of the explosion-proof housing, the radio antenna extending substantially upward.
4. The structure for mounting electronic devices as defined in claim 1 wherein the explosion-proof housing further comprises a metallic cylinder having an axis therethrough, the axis oriented substantially horizontally.

5. The structure for mounting electronic devices as defined in claim 1 further comprising a solar panel array mounting bracket mechanically connecting the solar panel array to the mast, the solar panel array mounting bracket providing both an azimuthal and inclination orientation adjustment of the solar panel array.

6. The structure for mounting electronic devices as defined in claim 1 wherein the bore axially through the mast is sealed with a sealing material.

7. The structure for mounting electronic devices as defined in claim 1 wherein the at least one electronic device further comprises;

a gas flow calculation computer; and

a communications radio coupled to the gas flow calculation computer and the radio antenna.

8. The structure for mounting electronic devices as defined in claim 7 wherein the radio antenna mechanically connects to the mast.

9. The structure for mounting electronic devices as defined in claim 8 wherein the antenna mast mechanically connects to an upper surface of the explosion-proof housing, the radio antenna extending substantially upward.

10. The structure for mounting electronic devices as defined in claim 9 wherein the explosion-proof housing further comprises a metallic cylinder having an axis therethrough, the axis oriented substantially horizontally.

11. The structure for mounting electronic devices in explosive environments as defined in claim 10 further comprising a solar panel array mounting bracket mechanically connecting the solar panel array to the mast, solar panel array mounting bracket providing both an azimuthal and inclination orientation adjustment of the solar panel array.

12. The structure for mounting electronic devices as defined in claim 11 wherein the bore axially through the mast is sealed with a sealing material.

13. A system for housing electronic devices in potentially explosive environments, the system comprising:

an electrical panel with an internal cavity, the electrical panel having an explosion-proof rating;

an antenna mast mechanically connected to the electrical panel, the antenna mast having an internal passage in communication with the internal cavity of the electrical panel;

a plurality of electrical wires extending from the internal cavity of the electrical panel through the internal passage of the antenna mast;

a sealing compound sealing at least part of the internal passage of the antenna mast, the plurality of electrical wires extending through the sealing compound;

a solar panel mechanically connected to the antenna mast by way of an adjustable mounting system, the solar panel also electrically coupled to at least one of the plurality of wires; and

a electromagnetic communication antenna mechanically connected to the antenna mast, the electromagnetic communication antenna electrically coupled to at least one of the plurality of wires.

14. The system for housing electronic devices as defined in claim 13 further comprising the antenna mast mechanically connected to an upper surface of the electrical panel and extending substantially upward.

15. The system for housing electronic devices as defined in claim 14 further comprising the electromagnetic communication antenna mechanically connected to a distal end of the antenna mast.

16. The system for housing electronic devices as defined in claim 13 wherein the electrical panel further comprises a plurality of prefabricated conduit ports, and wherein the antenna mast does not couple to the prefabricated conduit ports.

17. The system for housing electronic devices as defined in claim 13 wherein the electrical panel further comprises a plurality of prefabricated conduit ports, and wherein the antenna mast utilizes only one of the prefabricated conduit ports.

18. The system for housing electronic devices as defined in claim 13 wherein the electrical panel has a substantially circular cross-section, the antenna mast mechanically connected on an upper portion of the substantially circular cross-section.

19. The system for housing electronic devices as defined in claim 13 wherein the antenna mast has a substantially circular cross-section, a length and a diameter, and wherein the length is greater than the diameter.

20. The system for housing electronic devices as defined in claim 19 wherein the ratio of the length of the antenna mast to its diameter is the greater of at least 15.9 millimeter or the internal diameter of the antenna mast.

21. The system for housing electronic devices as defined in claim 13 wherein the antenna mast is threadingly connected to the electrical panel.

22. The system for housing electronic devices as defined in claim 21 wherein the antenna is threadingly connected to the electrical panel with at least five threads and eight millimeters of axial engagement to meet explosion-proof standards.

23. The system for housing electronic devices as defined in claim 22 wherein the antenna mast is threadingly connected to the electrical panel with at least 6 threads to meet Underwriter's Laboratory (UL) explosion-proof standards.

24. The system for housing electronic devices as defined in claim 22 wherein the antenna mast is threadingly connected to the electrical panel with at least 5 threads to meet the Canadian Standards Association (CSA) explosion-proof standards.

25. The system for housing electronic devices as defined in claim 13 wherein the plurality of wires further comprises a coaxial cable and set of wires comprising a positive and negative lead from a battery inside the electrical panel.

26. The system for housing electronic devices as defined in claim 25 wherein the coaxial cable electrically couples to the electromagnetic communication antenna and the set of wires couples to the solar panel array.

27. The system for housing electronic devices as defined in claim 13 wherein the sealing compound is Chico[®] A Sealing Compound manufactured by Cooper Industries Inc./Crouse-Hinds Electrical Construction Materials.

28. The system for housing electronic devices as defined in claim 13 wherein the adjustable mounting system for the solar panel further comprises an azimuthal bracket mechanically connected to the antenna mast, the azimuthal bracket providing at least partial selective azimuthal rotation.

29. The system for housing electronic devices as defined in claim 28 wherein the azimuthal bracket is rotatably connected to the antenna mast.

30. The system for housing electronic devices as defined in claim 29 wherein the azimuthal bracket is adapted for 360 degrees of azimuthal rotation.

31. The system for housing electronic devices as defined in claim 28 wherein the adjustable mounting system for the solar panel further comprises an inclination bracket mechanically connected to the azimuthal bracket and the solar panel, the inclination bracket adapted for at least partial selective inclination adjustment of the solar panel.

32. The system for housing electronic devices as defined in claim 13 wherein the solar panel and the electromagnetic communication antenna each have an intrinsically safe rating.

33. The system for housing electronic devices as defined in claim 13 wherein electromagnetic communication antenna is radio frequency antenna.

34. The system for housing electronic devices as defined in claim 13 wherein electromagnetic communication antenna is satellite dish.

35. A structure comprising:

a housing means for mounting at least one electronic device in potentially explosive environments;

a solar panel means for generating electrical energy from energy of the sun;

an antenna means for facilitating electromagnetic communication with distant devices; and

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a mast means for mounting the solar panel means and providing a passage for wires from an internal cavity of the housing means to the solar panel means and the antenna means, the mast means mechanically connected to the housing means.

36. The structure as defined in claim 35 wherein the mast means is also for mounting the antenna means.

37. The structure as defined in claim 35 wherein the housing means further comprises an electrical panel having an explosion-proof rating.

38. The structure as defined in claim 37 wherein the electrical panel having the explosion-proof rating further comprises a cylindrical shape having an axis, the axis oriented substantially horizontally.

39. The structure as defined in claim 35 wherein the solar panel means further comprises a solar panel array with an intrinsically safe rating.

40. The structure as defined in claim 35 wherein the antenna means further comprises an electromagnetic communication antenna.

41. The structure as defined in claim 40 wherein the electromagnetic communication antenna further comprises a radio frequency communication antenna.

42. The structure as defined in claim 41 wherein the mast means mechanically connects to an upper surface of the housing means, the radio frequency antenna extending substantially upward.

43. The structure as defined in claim 35 further comprising a mounting means for mechanically connecting the solar panel means to the mast means, the mounting means also for adjusting both the azimuthal and inclination orientations of the solar panel means.

44. The structure as defined in claim 43 wherein the mounting means further comprises an azimuthal bracket to provide at least partial selective azimuthal rotation of the solar panel means

45. The structure as defined in claim 44 wherein azimuthal bracket is rotatably connected to the mast means, the azimuthal bracket providing substantially 360 degrees of selective azimuthal rotation of the solar panel means.

46. The structure as defined in claim 44 wherein the mounting means further comprises an inclination bracket connected to the solar panel means and the azimuthal bracket, the inclination bracket providing at least partial selective inclination adjustment of the solar panel means.

47. The structure as defined in claim 35 wherein the mast means further comprises a metallic cylinder having a substantially circular cross-section and having an axial bore therethrough, the axial bore providing the passage for wires from the internal cavity of the housing means to the solar panel means and the antenna means.

48. The structure as defined in claim 47 further comprising a sealing means in the axial bore to restrict the passage of gases, vapors and flames.

49. The structure as defined in claim 48 wherein the sealing means further comprises Chico® A Sealing Compound.

50. The structure as defined in claim 35 wherein the at least one electronic device further comprises;

a gas flow calculation computer; and

a communications radio coupled to the gas flow calculation computer and the radio antenna.